

Ampex ADAPT:[™] A Composite Digital Layering Device



AMPEX

ADAPT™, the cost-effective bridge from analog to digital.

Flexible Digital Architecture with an Analog Front End

The ADAPT system is a composite digital combiner with a variety of single layer capabilities. Provided with flexible full-bus switching, the system can perform background mix transitions, as well as mix key and fade-to-black transitions. All transitions can be executed manually by fader or automatically by keypad-specified, frame-accurate rates.

The ADAPT system accepts up to 4 composite digital inputs which may be used for backgrounds, key insert video, or key signals (isolated keys). Luminance key (and optional chroma-key) signals can also be derived from any of these sources. With the Analog I/O option, up to 6 analog inputs plus 6 analog isolated key hole cutters can also be used interchangeably with digital sources for backgrounds or keys. The Analog I/O option also comes with two analog outputs for monitoring, or for use by the ADAPT device as an analog keyer.

Two digital outputs are provided standard; one line out, and the second

line/key switchable. The digital key signal output may be recorded from the system to create traveling matte reels.

Digital Keying at the Heart of the Process

An important feature of this advanced system is the ability to generate a digital key signal from any D-2 source. The ADAPT device features a comprehensive set of keying adjustments that insures high quality digital keys. Key memory stores input by input key type, key levels, and keying options for ease of operation and perfect repeatability.

The usual analog keying control is provided, plus a variety of new capabilities afforded by digital technology. A wide variety of subtle key edge treatments, including variable edge softness filters, separate insert and hole clip controls, tailored edge curves, and additive key processing are all standard. Keys may be self filled, monochrome self filled, or filled using the system's internally generated color matte signal. Adjustable position drop shadows in either of two densities can be added to emphasize any key.

Mask capability is also provided. The rectangular mask shape may be fully adjusted, and the mask may be inverted for images to be displayed outside of the mask shape, or used to force portions of the key which may be dropping out.

Spectrakey™

Ampex's unique chroma nulling process has been enhanced and is provided in the Digital Chroma Keyer Option. Spectrakey makes it possible to key difficult subjects, as well as key through transparencies such as smoke or glass objects. The ADAPT system's Spectrakey can null unwanted chroma at key edges and transparencies as well as null luminance to allow adjustable density of shading. Spectrakey is the ideal solution for creating composite digital mattes.

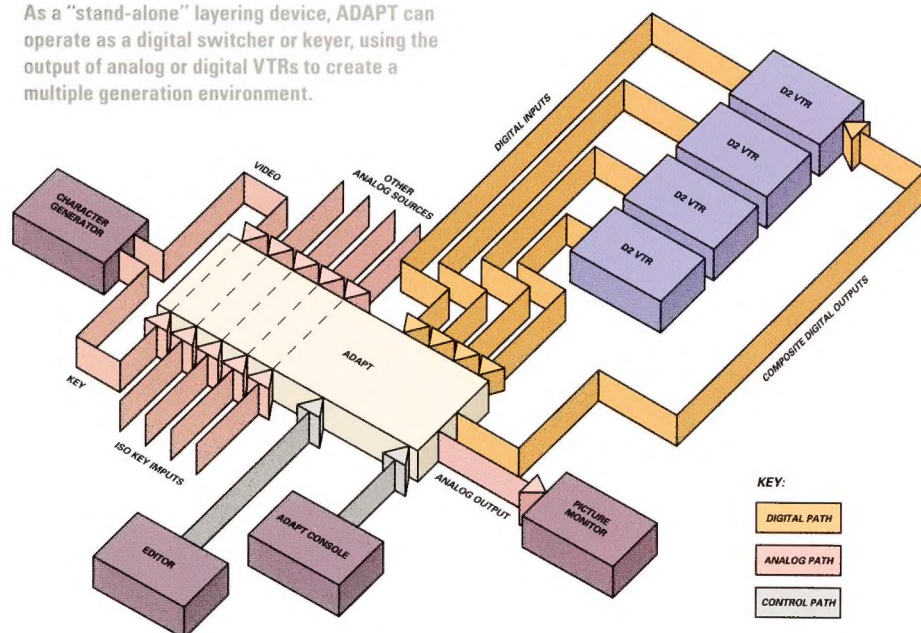
Flexible System Control

The ADAPT device has three serial ports which provide for control from an optional control panel, from any editor, or from a master Ampex Century™ switcher.

When using the ADAPT system under edit control, two interface variations are provided; SMPTE RS-422 (using GVG Model 100™ protocol) or assignable function GPIs (general purpose interfaces). So whether you choose to use the system as a way to provide digital mixes and keys in your analog suite, or as a stand-alone digital switcher, the ADAPT system is ready for operation with your edit controller.

The ADAPT system's optional control panel can be used with either of the above applications to access extended features. The dedicated panel also gives users the ability to breakaway control for manual override and ultimate flexibility, plus use ADAPT as a stand-alone device in any environment.

As a "stand-alone" layering device, ADAPT can operate as a digital switcher or keyer, using the output of analog or digital VTRs to create a multiple generation environment.





Applications from simple to simply impressive!

The ADAPT layering device extends the capability of your analog switcher by adding high quality digital mixes and keys to the program output. Or, as a "stand-alone" layering device, it can operate as a digital switcher/keyer using any mix of analog and digital VTRs to create a multiple-generation environment with a D-2 record machine.

Composite Digital Island

A composite digital island may be created by using the ADAPT device as a mixer/keyer with D-2 tape machines and an edit controller. In this configuration, using the ability to generate a key signal from any source, it may be used for graphics or other applications where high quality and multiple generations are required.

Generation Intensive Projects

When the system is used with D-2 VTRs, a significant improvement over digital disk recorders is achieved. Digital disk recorders suffer from two important limitations; short record times, and material is overwritten by each subsequent generation. The ADAPT device, with two D-2 machines, allows you to continually archive material as it is recorded on tape. Record times are limited only by the length of tape in the machine.

Composite Digital Matte Reels

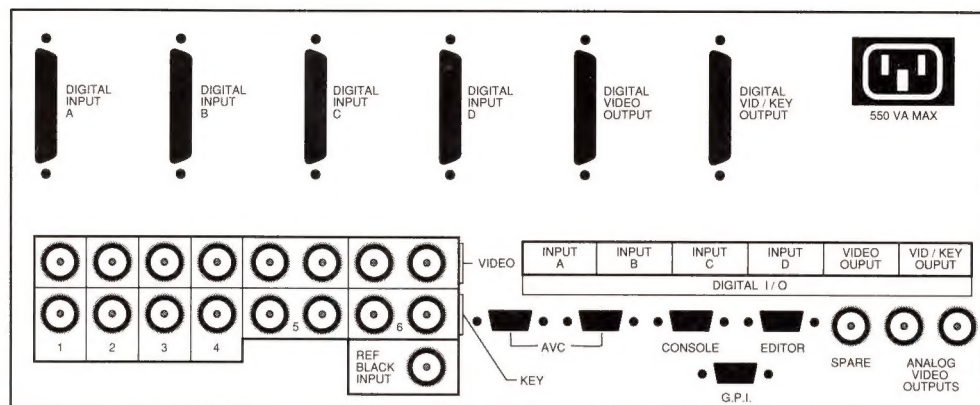
The Spectrakey system's unique chroma nulling process combined with the ADAPT device's high quality digital chroma keying capability is the ideal tool for creating composite digital matte reels, because a digital key signal output is provided.

Telecine & Program Distribution

The ADAPT system's digital keying can be used for adding digital subtitles to foreign films or adding specialized graphics to D-2 distribution material. The system is an ideal companion to the ACR-225 D-2 cart machine, and may be used to add digital graphics or titles to D-2 output. When the distribution is on the D-2 tape format, keys can be added with no loss in quality.

The Solution to the Analog/Digital Dilemma

The investment made in analog equipment requires that intelligent, economical choices be made when moving to digital. By providing digital capability in your analog environment, the ADAPT system fills your client's demand for digital switching at a minimal increase to your rate card.



ADAPT provides the flexibility of analog while delivering the transparent layering capabilities of digital.

Specifications

STANDARD COMPOSITE DIGITAL I/O

| | |
|----------------------------|--|
| Digital Inputs A through D | SMPTE proposed T14.22/082 (25 pin D) standard, Serial Input optional (Primary Video or ISO inputs) |
| Digital Video Output | SMPTE proposed T14.22/082 (25 pin D) standard, Serial Output optional (LINE OUT or Diagnostics) |
| Digital Video/Key Output | SMPTE proposed T14.22/082 (25 pin D) standard, Serial Output optional (LINE OUT or Processed FG Key) |
| Reference input | Analog black burst reference; Terminated input, Automatically switches internal standard to NTSC or PAL to match the reference |

OPTIONAL COMPOSITE ANALOG I/O

| | |
|--------------------------|--|
| Video Inputs 1 through 4 | 75 Ohm terminated; 1.0V p-p composite video; Return Loss \leq -40 dB DC to 5 MHz |
| Video Inputs 5 and 6 | Looping (requires 75 Ohm terminator); 1.0V p-p composite; Return Loss \leq -40 dB DC to 5 MHz |
| Key Inputs 1 through 4 | 75 Ohm terminated; 1.0V p-p with sync; 0.7V p-p without sync; Return Loss \leq -40 dB DC to 5 MHz |
| Key Inputs 5 and 6 | Looping (requires 75 Ohm terminator); 1.0V p-p with sync; 0.7V p-p without sync; Return Loss \leq -40 dB DC to 5 MHz |
| Analog Video Outputs | Two 75 Ohm outputs; 1.0V p-p composite video; Return Loss \leq -40 dB DC to 5 MHz (LINE OUT or Diagnostics) |

TIMING

| | |
|------------------------|--|
| Digital Inputs | $\pm 15 \mu\text{s}$ clocks with respect to reference; Auto-phasing |
| Analog Video Inputs | $\pm 6.0 \mu\text{s}$ Horizontal (with respect to reference) ≤ 90 degrees subcarrier (with respect to each other); Auto-phasing |
| Analog Key Inputs | $\pm 300 \text{ ns}$ (with respect to the associated video) |
| Digital/Analog Outputs | Approx. 1.5 lines delay (with respect to reference) |

DIGITAL VIDEO PERFORMANCE

| | |
|---------------------|---|
| Digital Inputs | 10-bit resolution |
| Digital Video Paths | 10-bit resolution |
| Digital Key Paths | 8-bit resolution |
| Digital Mixer | 12-bit \times 12-bit mixer with 24-bit adder; Dither added to round to 8 or 10 bits out (user selectable) |
| Blanking Processor | Digital blanking (sync & burst) reinsertion |

ANALOG VIDEO PERFORMANCE

| | |
|---|--|
| Analog-to-Digital Converter | 9-bit resolution |
| Digital-to-Analog Converter | 10-bit resolution |
| Signal/Noise Ratio | $\geq 54 \text{ dB}$ luminance (unified weighting CCIR 567-2) $\geq 44 \text{ dB}$ unweighted, 10 kHz to 5 MHz |
| Frequency response (Ref. to subcarrier) | $\pm 0.3 \text{ dB}$: 100 kHz to 5.5 MHz |
| Chrominance/Luminance Gain | |
| Inequality | $\leq 0.2 \text{ dB}$ (12.5T modulated pulse) |
| Chrominance/Luminance Delay | |
| Inequality | $\leq 30 \text{ ns}$ (12.5T modulated pulse) |
| Differential Gain | $\leq 2.0\%$ (10 to 90% APL) |
| Differential Phase | ≤ 1.0 degrees (10 to 90% APL) |
| K pulse | $\leq 1.0\%$ (2T pulse) |
| K pulse-to-bar | $\leq 1.0\%$ (2T pulse) |
| Chroma Phase accuracy | ≤ 1.5 degrees at subcarrier |
| Line Tilt | $\leq 0.5\%$ (IEEE window signal) |
| Field Tilt | $\leq 1.0\%$ (IEEE window signal) |

Analog specifications apply to one A/D plus one D/A conversion (analog in to analog out).

ENVIRONMENTAL

| | |
|-----------------------|---|
| Temperature (ambient) | 0° to 45° Celsius (operational) |
| | 20° to 30° Celsius (for analog specification) |
| Humidity (relative) | 10% to 90% non-condensing |

POWER

| | |
|--------------------------------|---|
| Input Voltage | 115/230 VAC at 50 Hz or 60 Hz nominal automatic voltage selection |
| Power (Signal Processing Unit) | 550 VA maximum |
| Power (Console) | 100 VA maximum |

PHYSICAL

| | |
|---------------------------------|--|
| Weight (Signal Processing Unit) | 15 kg (33 lbs) alone; 25 kg (55 lbs) shipping weight |
| Weight (Console) | 5 kg (11 lbs) alone; 10 kg (22 lbs) shipping weight |

Ampex reserves the right to make product or specification changes at any time without notice

FOR INFORMATION ON AMPEX BROADCAST VIDEO PRODUCTS CONTACT THE VIDEO SALES MANAGER NEAREST YOU.

CALIFORNIA
(818) 365-8627
San Fernando

MARYLAND
(301) 530-8800
Bethesda
NEW JERSEY
(201) 825-9600
Allendale
(212) 947-8633
New York

AUSTRALIA
(008) 023124
North Ryde, NSW
BELGIUM
067/214921
Nivelles

CANADA
(416) 821-8840
Mississauga, Ont.
FRANCE
(01) 4270-5500
Paris
GERMANY
6196/76500
Sulzbach
(89) 932039
Munich

HONG KONG
(852) 7361866
Kowloon
ITALY
(06) 500971
Rome
JAPAN
(03) 767-4521/2/3
Tokyo

LATIN AMERICA/
CARIBBEAN
(305) 475-7205
Davie, Florida
NETHERLANDS
030-612921
Utrecht
SPAIN
(91) 241-0919
Madrid

SWEDEN
08/28 29 10
Sundbyberg
SWITZERLAND
(037) 21.86.86
Fribourg
UNITED KINGDOM
(0734) 875200
Reading, Berks.

AMPEX